

Kit Instruction Manual

Traveler II & Traveler II SE



Crystal Radio Supply

<http://www.crystalradiosupply.com>

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Introducing the Traveler II AM Band Crystal Radio

Traveler II



**Traveler II
Special Edition**



The Traveler II and the Traveler II SE are electronically the same radio. The only mechanical differences between the two sets are:

1. The Special Edition model uses an 8:1 planetary drive capacitor for the detector tuner, whereas the Traveler II uses a direct drive unit.
2. The Special Edition model uses a 6:1 dual-gang planetary drive capacitor for the antenna tuner, whereas the Traveler II uses a direct drive dual-gang unit
3. The Special Edition unit uses dial pointers and more expensive new old stock (NOS) knobs to take advantage of the additional band spread of the planetary drive capacitors.

Both Sets have the following features:

1. For portability, they are built in a tough ABS box that measures approximately 7-7/8" x 4-1/4" x 2-1/2". An assembled unit weighs approximately 1 pound and 10 ounces.
2. A cast acrylic dial plate that is reverse engraved (engraved on the back side of the dial plate so that there is no ink to wear off).
3. The high quality plated binding posts will accept many ways of making connections, including holes that will accept pins from the old-style magnetic headphones.

4. The 1/4" phone jack automatically switches the audio output from the binding post circuit, containing a 47 K resistor, to the phone jack when the headphones are plugged in. The binding posts work great for very high impedance headphones, such as the included ceramic earphone, while the phone jack can be used for lower impedance headphones or even a speaker – for those extra strong signals.
5. These sets use high Q ferrite Litz coils that are wound with 175/46 Litz wire and have a quality factor of 620 @ 790 KHz
6. The Traveler uses the very popular Tuggle front-end circuit that is valued for its fine selectivity.
7. Variable inductive coupling is provided, a feature seldom found on a receiver of this size.
8. Crystal Radio Supply's exclusive 2:1 reduction gear box provides a full 180 degrees of variable coupling for a 90 degree change in coil orientation. It is made from high quality Delrin gears and a marine-grade HDPE housing with all-brass hardware and a spring-temper bronze brake. This provides precise tuning as well as resetting of your inductive coupling when you return to a station.

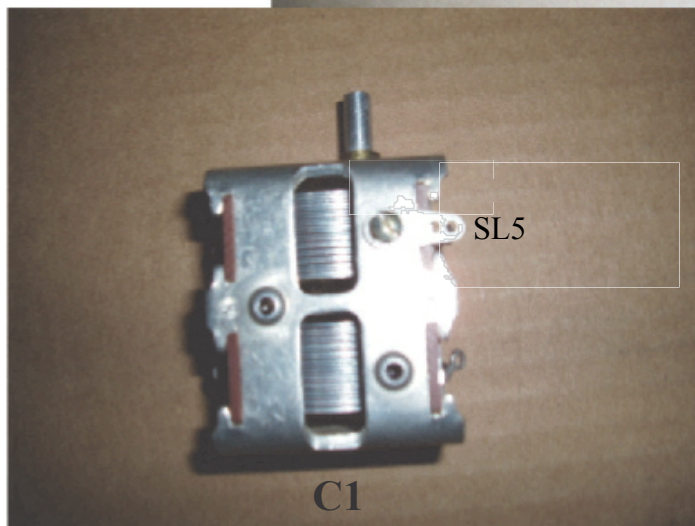
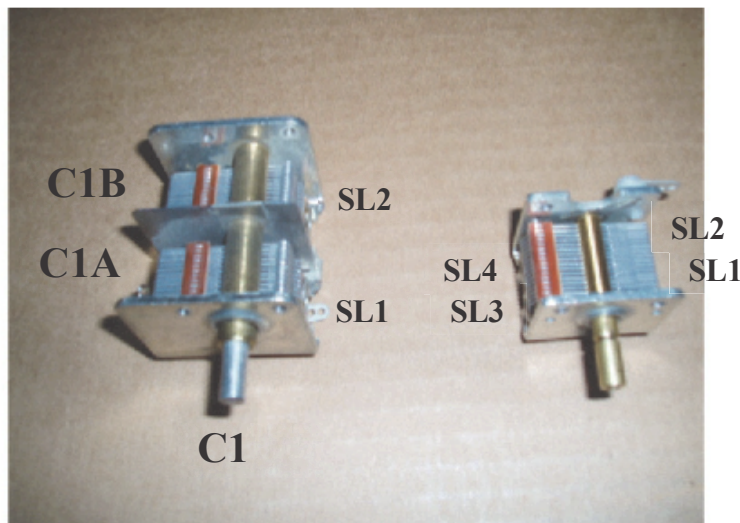
Care of the Front Panel

The Front Panel on your Traveler II Crystal Radio Set is made from High Quality "Cast Acrylic". This grade of Acrylic is superior over other grades of acrylic and will still look beautiful after many years of service if the following simple precautions are observed:

1. Do not use paper towels to clean your front panel as this may cause scratches.
2. Use a soft cotton fabric such as that from a cotton T-shirt.
3. To remove fingerprints and smudges, clean your panel with isopropyl alcohol (rubbing alcohol) that can be found at most pharmacies.
4. Do not use detergents.
5. Do not touch the front of your panel; only handle it by the edges.

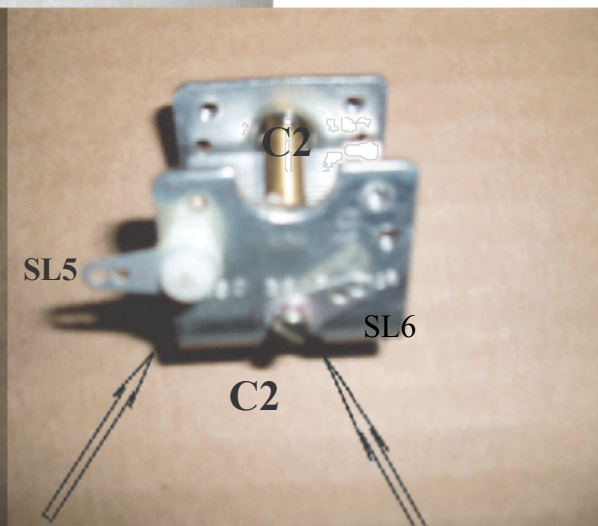
Assembly Instructions for the Traveler II Crystal Radio

Capacitor identification and preparation



Step 1.

On the bottom of C1, install a #6 solder lug using a #6 fillister head screw. Fillister head screws are the ones with the thick round heads.



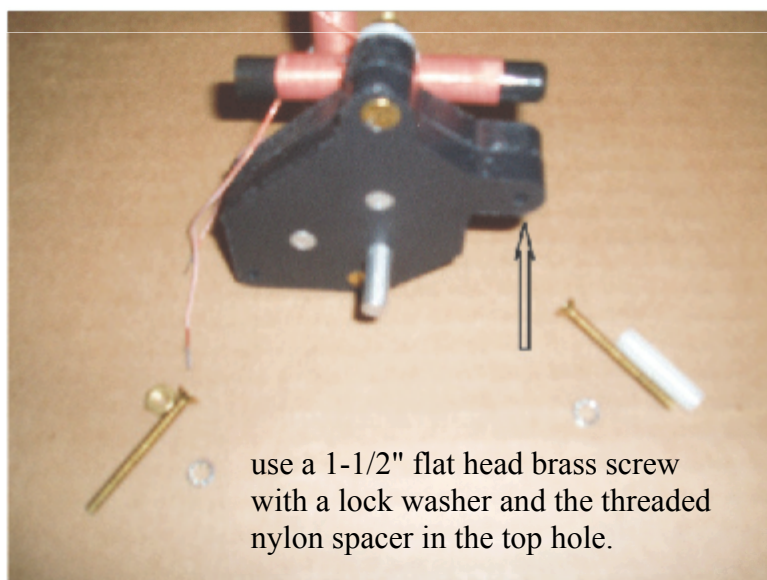
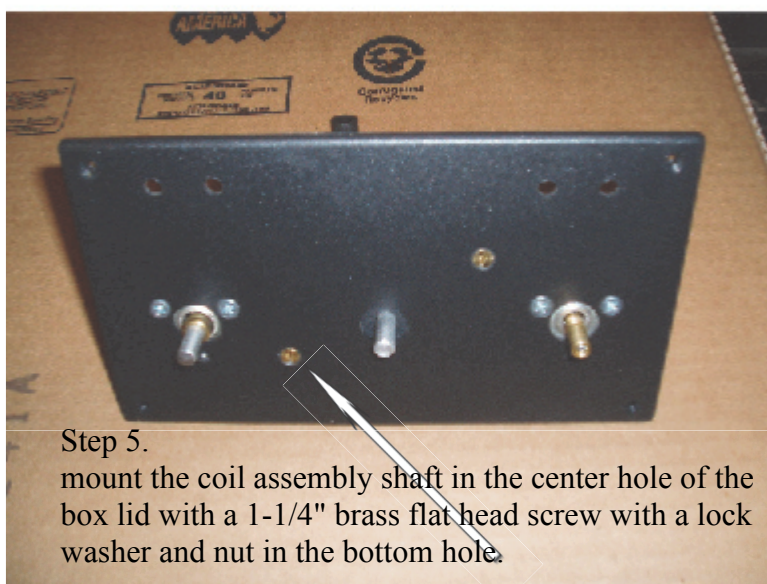
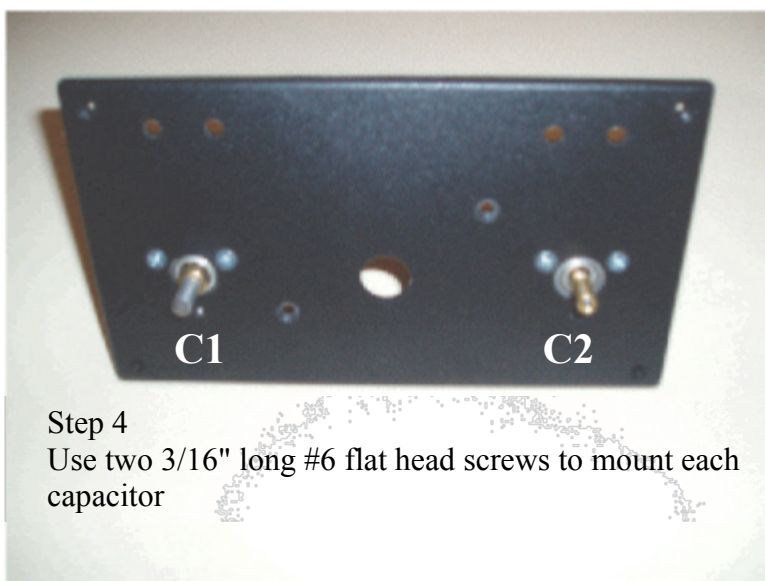
Step 2.

On the back of C2, mount a #6 solder lug using a #6 fillister head screw. Fillister head screws are the ones with the thick round heads.

Step 3.

In the bottom center hole on the back of C2, install a #6 solder lug using a #6 fillister head screw. Bend the solder lug up slightly as shown.

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In the steps below, when handling the dial plate do not touch the face. Only handle by the edges

Set the lid assembly on top of the box while you perform the next step.



Step 6.

Place the dial plate on the box lid as shown and start two 1/4" #6 round head screws in the bottom capacitor holes. These screws will secure the bottom of your dial plate to the box lid. Leave these screws loose for now; do not tighten.



Step 7.

Install the binding posts as shown on page 1. Observe the disassembled binding posts above. The large section goes on the top side of the lid and all the other parts are installed on the bottom of the lid in the order shown from left to right. Do not install the last two parts on each binding post until after the next step. (The solder lug and one of the nuts.)

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Step 8.

As shown above insert a small screwdriver thru the holes in the binding posts and hold them in the above vertical alignment while you tighten the nut on the bottom of each binding post.

You can also tighten the bottom capacitor screws at this time. Be careful and do not over-tighten as you may damage the dial plate.



Step 9.

Now install a #10 solder lug and brass nut on each binding post and tighten them down with the solder lugs pointed in the directions shown above.

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Installation of knobs and pointers.



Step 10.

Make sure the two coils are parallel to each other then install the "Coupling" knob with the line pointed at the "100" mark on the dial.

Step 11.

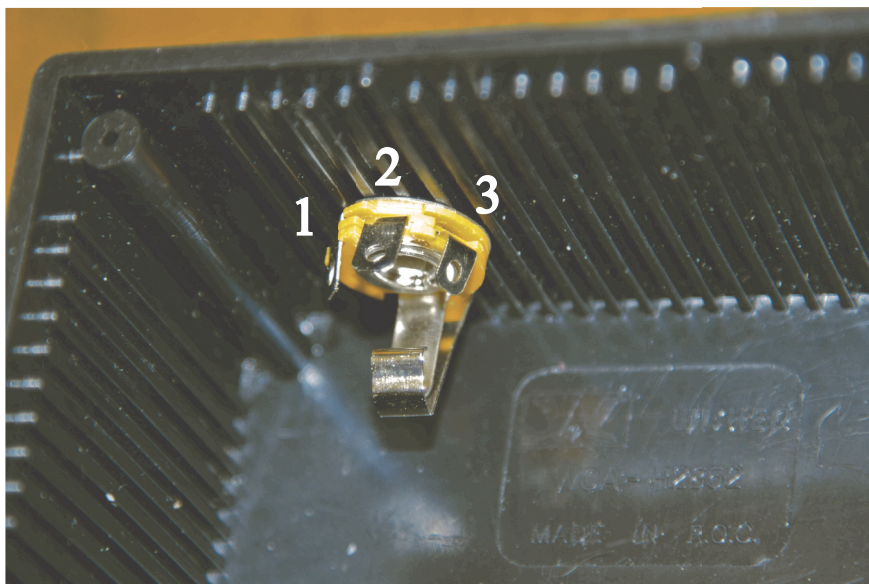
Fully close the tuning capacitors C1 and C2 and for the Traveler II SE, install the dial pointers as shown, pointed at the zero mark on the dial plate. (If you have the Traveler II, instead of the dial pointers, install the knobs with the white line aligned to the zero marks.)

Do not over tighten the dial pointers. Only tighten them enough to keep them from slipping.

Once the dial pointers are installed, Traveler II SE owners can install their tuning knobs. (These knobs have no white mark.)

The knobs and binding post will help protect the dial panel during the remainder of the assembly process. However, it is a good idea to lay the assembly on a soft cloth such as a cotton T-shirt.

If you do use a cloth under the assembly, be careful and do not let it catch fire from soldering.



Step 12.

Install the phone jack in the ABS box as shown with the long part of the phone jack on the bottom. Secure with the hardware provided.

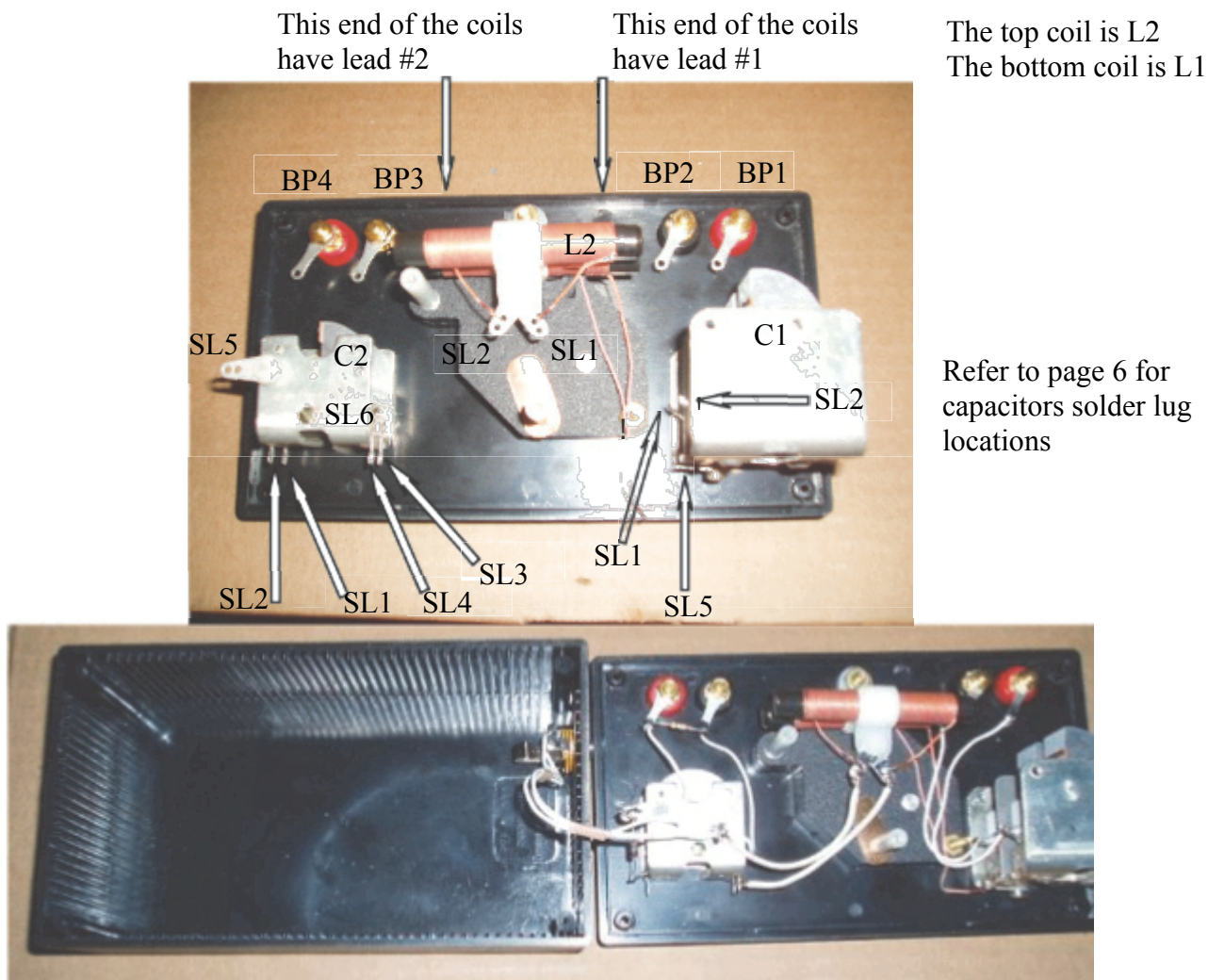
Step 13.

Prepare two lengths of #24 gauge TEST LEAD wire by cutting each to the length of 3-1/4" and by removing 1/4" of insulation from each end.

Prepare the following lengths of #26 gauge solid-strand hookup wire by cutting to the desired length and by removing 1/4" of insulation from each end.

- 2 wires 4" long
- 1 wire 4-1/2" long
- 2 wires 6" long
- 1 wire 6-1/2" long

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Step 14. Check off when each number is finished.

Do not bend the soldered ends of the wires of coils L1 and L2, as they are brittle and may break. Just place them in the solder lug holes and allow the solder to hold them in place.

1. Make sure lead #1 of coil L2 is attached to the top hole of SL1 that is mounted on the coil tuning shaft.
2. Make sure lead #2 of coil L2 is attached to the top hole of SL2 that is mounted on the coil tuning shaft.
3. Connect one end of a 3-1/4" long Test Lead Wire to SL4 of capacitor C2 and the other end to SL1 on the coil tuning shaft. Solder both ends including coil lead #1 from coil L2.
4. Connect one end of a 3-1/4" Test Lead wire to SL6 on the back of capacitor C2. Do not solder. Connect the other end of this wire to SL2 that is mounted on the coil tuning shaft and solder this connection along with the coil lead #2 from coil L2.

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5. Connect coil lead #1 from coil L1 to solder lug #5 of capacitor C1 and solder.
6. Connect coil lead #2 from coil L1 to solder lug SL2 on capacitor C1, but do not solder at this time.
7. Connect a 4" solid strand hookup wire to SL1 of capacitor C1 and connect the other end to the solder lug on binding post #2 and solder and solder both ends.
8. Connect one end of a 4-1/2" long hookup wire to SL2 of C1 and solder two wires. Connect the other end to the solder Lug on binding #1 and solder.
9. Connect one end of a 4" hookup wire to SL6 of C2 and the other end to the solder lug of binding post #3. Do not solder at this time.
10. Connect one end of the 47 K resistor to the solder lug on binding post #3 and solder. Connect other end to the solder lug on binding post #4. Do not solder.
11. Connect one end of a 6-1/2" hookup wire to the solder lug of binding post #4 and solder two wires. Connect the end to solder lug #3 of the phone jack and solder.
12. Connect one end of a 6" hookup wire to solder lug #6 of C2 and solder three wires. Connect the other end to solder lug #1 on the phone jack and solder.
13. Connect one end of a 6" hookup wire to solder lug #2 on the phone jack and solder. Connect the other end to the outside hole of SL5 on C2. Do not solder.
14. Connect the banded end of the 1N34A diode to the bent up solder lug SL2 of C2 and the other end to the inside hole in SL5 and solder both ends.

Congratulations! You have just finished wiring up your crystal radio. Just mount the lid on the box with the four black screws and you are done and ready to fire it up. You will be amazed at its accurate tuning of the full broadcast band and its outstanding ability to separate adjacent stations using various degrees of coupling and fine-tuning of the antenna and detector capacitors.

Basic Tuning Procedures

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To tune across the band, set the coupling at about 50 and set both capacitors at zero.

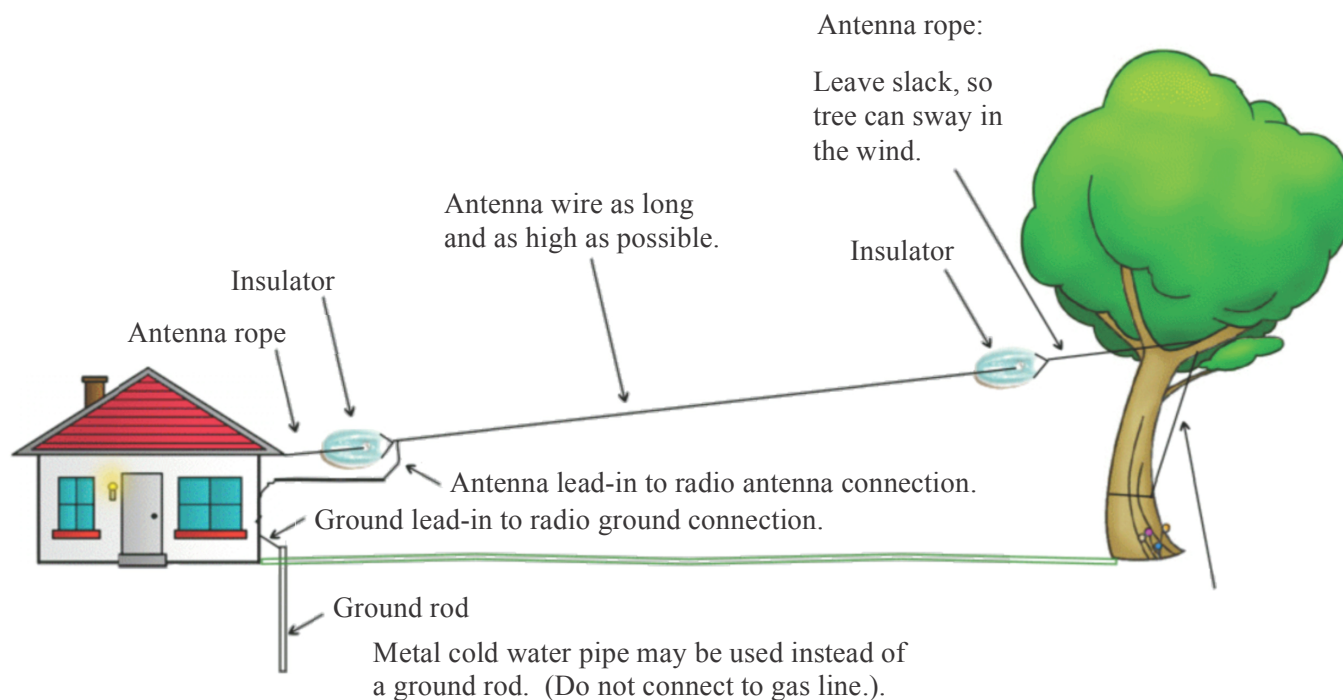
Slowly rotate both capacitors simultaneously keeping both pointers at approximately the same place on the dial. When a station is found, adjust both the capacitors and the inductive coupling for best reception.

The less coupling, the better the selectivity. Just take your time and you will master the tuning quickly and will be amazed at the stations that you can dig out of nowhere.

The Traveler II is a quality hi-performance crystal radio. However, without a good outdoor antenna and ground system you will never realize it's full potential. The ceramic earphone that came with the Traveler II is very sensitive. However they are cheap little things and do not last very long. So if you intend to use them, spares are recommended.

It is recommended that you purchase a pair of high-impedance headphones so that you can use both ears. A unit with an impedance of 2000 ohms or more is recommended. Normally headphones of the magnetic type can be purchased used or NOS.

Typical Antenna Installation

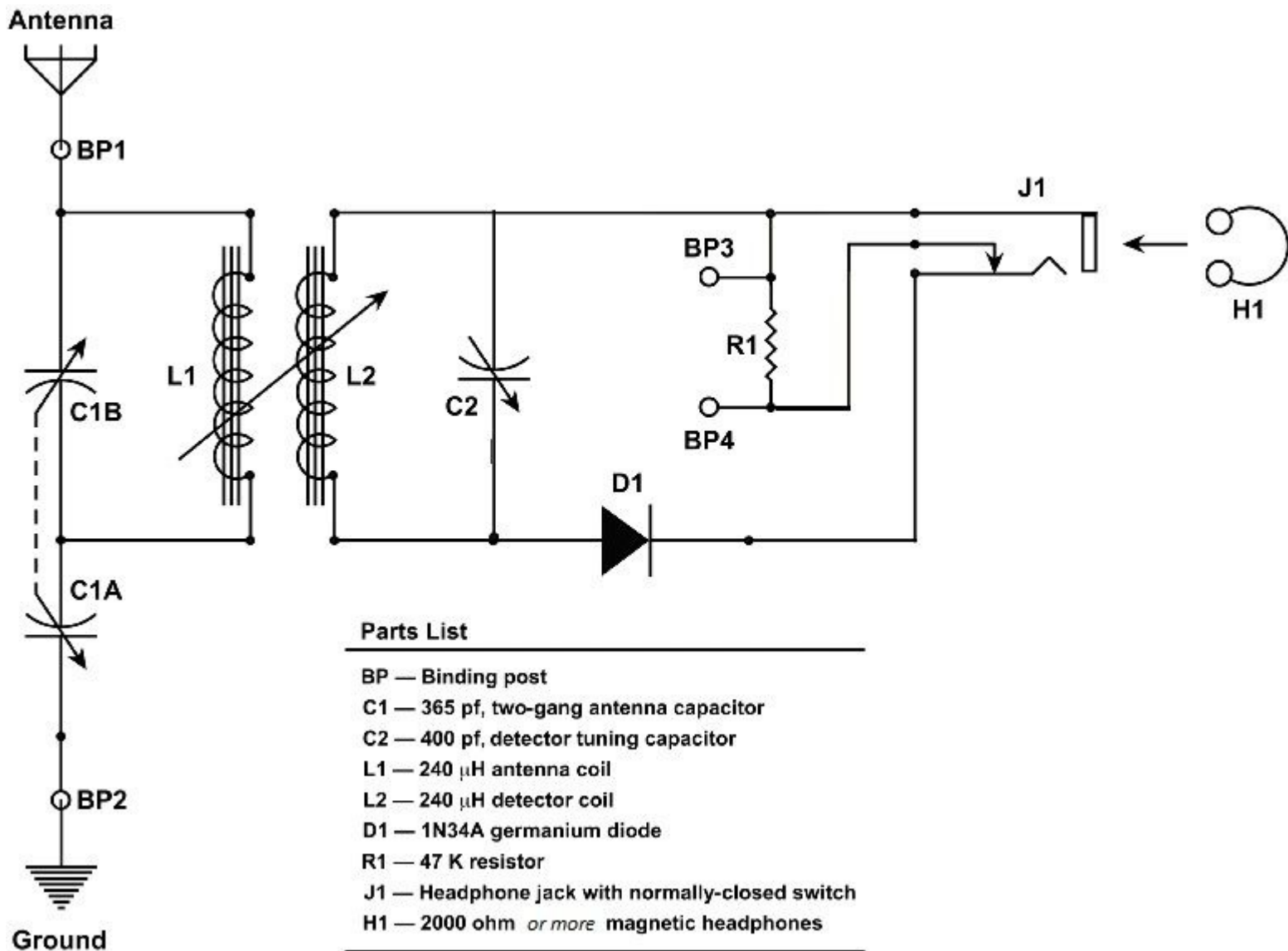


For safety purposes, a lightning arrestor must be installed in the lead-in wire. If not, remove the lead-in wire from the house when not in use or at least during thunderstorms.

To increase your antenna's length, you can extend it to additional insulated supports – it need not run in a straight line. The length of your antenna greatly affects the performance of your set. A 100 ft or more antenna is considered very good. However, everyone does not have room for a long antenna. In most cases, you just put up the best antenna you can and that is the performance that you get. If you can only get up a short antenna, you can help match it to the radio by adding a coil of wire to the lead-in wire.

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Traveler II & Traveler II SE Schematic



Hi-impedance headphones, such as the included ceramic earphone, can be connected across BP3 and BP4 where R1 provides better sound quality. This resistor can be omitted or altered in value to optimize performance with other headphones.